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Check List
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LISTS OF SPECIES

Fish Checklist of Perak River, Malaysia

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ABSTRACT: Out of the 1000 species of freshwater fish documented in the South-East Asian Tropics, 420 species can be found in Malaysia. Based on experimental gill net studies, Perak River recorded a total of 107 fish species, which comprises of 33 families with Cyprinidae as the dominant family, with 43 species. The fluctuating number of species and species replacement in the upstream direction in this river reflects the orientation of the River Continuum Concept. Gradient changes of salinity, habitat heterogeneity, water velocity and riverbed materials are some of the factors that may contribute to the fluctuation and species replacement.

INTRODUCTION

Malaysia is one of the countries that are rich in biodiversity and recognized internationally as a 'hot mega-diversity country'. Within the 1000 species of freshwater fish species found in the South-East Asian Tropics, 420 species can be found in Malaysia (Ismail and Sabariah 1995; Chong *et al.* 2010). In Malaysia, the freshwater fish species can be divided into two zoogeographic regions. The first region is the Peninsular Malaysia, where the fishes are similar to that of the mainland Asiatic ichthyofauna and is of Sundaic origin. The second region is west Malaysia, that is Sabah and Sarawak, which is part of the zoogeographic area of Borneo, together with Sumatra and Java islands (Mohsin and Ambak 1991; Zakaria –Ismail 1994; Yap 2002).

Perak River is the second longest river in Peninsular Malaysia, after Pahang River. With a total length of 420 km, Perak River is a unique river system as it is the only river in Malaysia that has four consecutive hydroelectric dams, namely, Temengor, Bersia, Kenering and Chenderoh. Constructed in different years, these four dams have their own geomorphology characteristics, especially in terms of sizes and depths. The dam constructions have indirectly converted the riverine system into a new lacustrine system in all four reservoirs. Therefore, we present a checklist of fish species based on studies conducted along the Perak River, including the four reservoirs.

MATERIALS AND METHODS

Data from two studies conducted along the Perak River, which were from 2001-2002 and 2009-2010 were compiled and presented. Sites covered were (in the downstream direction with GPS reference coordinate) Temengor Reservoir (T) (05.54705° N, 101.33739° E) , Bersia Reservoir (B) (05.41432° N, 101.22107° E), Kenering Reservoir (K) (05.33895° N, 101.15918° E), Chenderoh Reservoir (C) (05.02302° N, 100.97241° E), lower Chenderoh (LC) (04.91674° N, 100.96680° E), Parit (Pt) (04.61685° N, 101.88348° E), Pasir Salak (PSlk) (04.16676° N, 101.00004° E) and Teluk Intan (TIn) (N 04.01677°; E 101.00021°) (Figure 1). All fishes were captured by using experimental gill nets measuring 250 cm vertical length x 2976 cm total width with stretch mesh sizes of 10 cm, 7.5 cm, 6.5 cm, 5 cm and 3.7 cm. The gill nets were deployed randomly and soaked overnight (Hubert 1996). All captured fish were labelled accordingly and placed in an ice-chest. Then, they were transported back to the laboratory for proper species identification based on standard taxonomic key (Mohsin and Ambak 1991; Kottelat *et al.* 1993; Rainboth 1996). Valid name of each species were based on current valid names as listed in Chong *et al.* (2010) and in the FishBase website (www.fishbase.org). Each fish were then measured for its total length and weight, and have been carefully preserved for further studies. Several individual fish from each species were kept as voucher specimens and are accessible at School of Biological Sciences, Universiti Sains Malaysia. Fishing permit for this study has been approved by Fisheries Department of Perak State.

RESULTS AND DISCUSSIONS

One hundred and seven fish species, which comprises of 32 families, have been recorded along the Perak River. Cyprinidae was the dominant family with 43 species, followed by Ariidae and Bagriidae with seven species each. The other families were represented by one to four species only. Pasir Salak has the highest number of species with 43 species (19 families), followed by Temengor Reservoir with 42 species (12 families) and Teluk Intan with 41 species (24 families) (Table 1). The lowest number of species was recorded at Bersia Reservoir with 17 species (eight families). Among the 107 species, only four species were present at all sites, which were *Hemibagrus nemurus* (Valenciennes, 1840), *Barbonymus gonionotus* (Bleeker, 1850), *Osteochilus vittatus* (Valenciennes, 1842) and *Notopterus notopterus* (Pallas, 1769). The presence of

these species at all sites indicated that these four species are highly tolerant and well adapted to environmental changes, especially in water quality.

The number of species present at each site fluctuated from the river mouth of the Perak River (Teluk Intan) to the Temengor Reservoir. The fluctuation and species replacement can thus be concluded to reflect the orientation of the River Continuum Concept as suggested by Vannote *et al.* (1980). Gradient changes of salinity, habitat heterogeneity, water velocity and riverbed materials are some of the factors that may contribute to the fluctuation and species replacement.

The construction of the dams, started as early as in the 1930's, which prevented the free movement of the fishes to migrate upstream and/or downstream, and habitat degradation since then, have resulted in the current fish assemblage and species checklist. *Probarbus jullieni*, which was said by the locals to have existed in the Temengor Reservoir, was omitted from the list due to unavailable evidence of its current existence. The Perak Fisheries Department, together with the collaboration from Pulau Banding Research Center are currently working on fish stocking program at the Temengor Reservoir, which includes the restocking of *P. jullieni*, *Tor tambroides* and *Hemibagrus nemurus* to the reservoir for a start. Similar stocking programs for other species will also be conducted in the future to guarantee the survival of these populations.

The number of species in this checklist is not final as there might be changes regarding the valid fish names in the future or new recorded species. Since Perak River is an open area, there is also a threat of irresponsible release of exotic species by individuals into the river which may harm and negatively affect the native species. Hopefully this checklist will be a good reference for current and future studies.

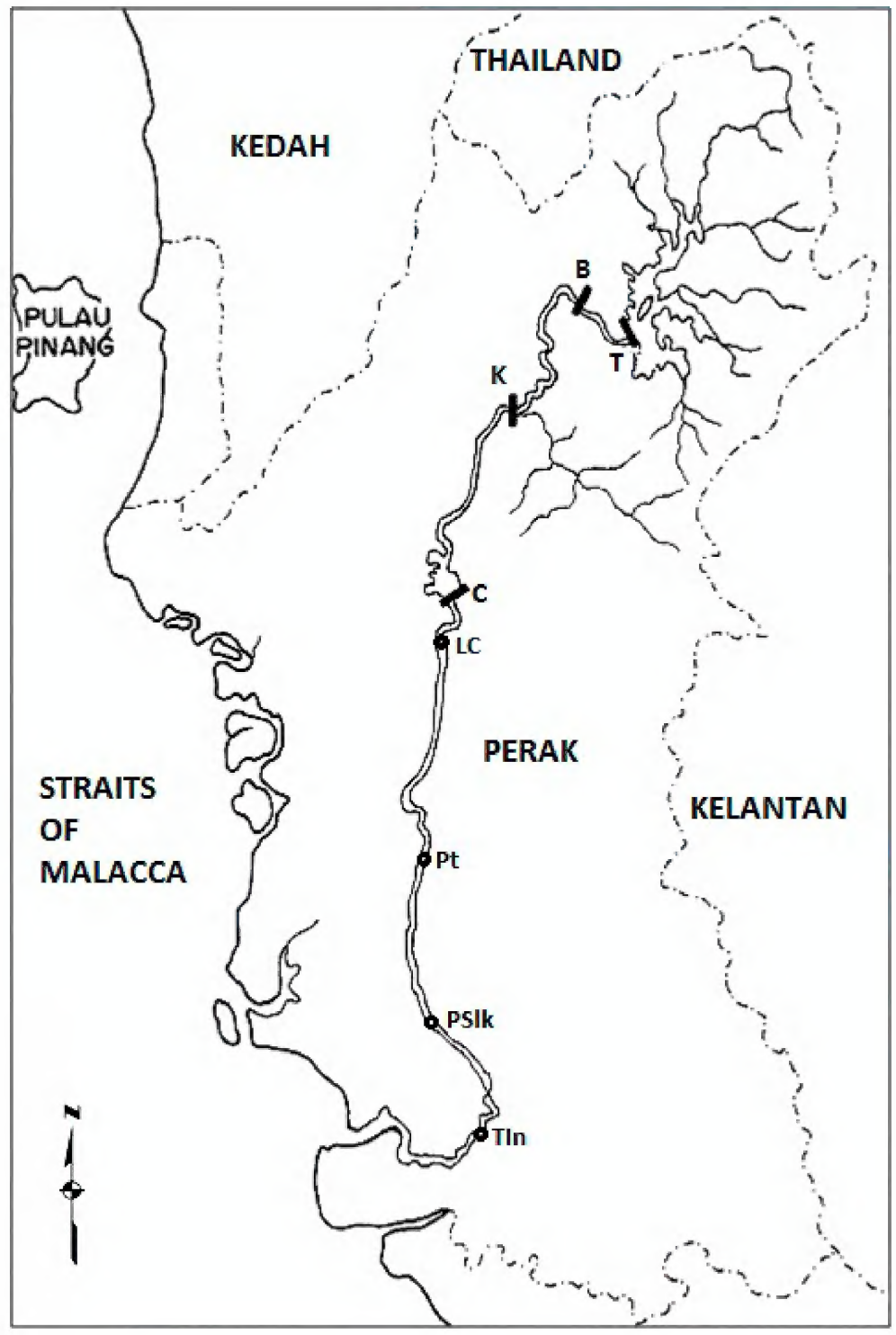

Figure 1. Locations of sampling sites along Perak River: Temengor Reservoir (T), Bersia Reservoir (B), Kenering Reservoir (K), Chenderoh Reservoir (C), lower Chenderoh (LC), Parit (Pt), Pasir Salak (PSlk) and Teluk Intan (TIn).

Table 1. Fish checklist of Perak River based on presence (+) – absence (-) data by site. Abbreviations for sites are TIn = Teluk Intan, PSlk = Pasir Salak, Pt = Parit, LC = Lower Chenderoh, C = Chenderoh, K = Kenering, B = Bersia, and T = Temengor.

FAMILY	SPECIES	VOUCHER # (USM/ BIO/...)	TIn	PSlk	Pt	LC	C	K	B	T
Ambassidae	*Parambassis apogonoides* (Bleeker, 1851)	2002/627	+	+	-	-	-	-	-	-
Anabantidae	*Anabas testudineus* (Bloch, 1792)	2002/295	-	+	-	-	-	-	-	-
Ariidae	*Arius jella* Day, 1877	2002/583	+	+	-	-	-	-	-	-
	Arius maculatus (Thunberg, 1792)	2002/091	+	+	-	-	-	-	-	-
	Cryptarius daugueti (Chevey, 1932)	2002/101	+	-	-	-	-	-	-	-
	Cryptarius truncatus (Valenciennes, 1840)	2002/290	+	-	-	-	-	-	-	-
	Ketengus typus Bleeker, 1846	2002/590	+	-	-	-	-	-	-	-
	Nemapteryx caelata (Valenciennes, 1840)	2002/536	+	-	-	-	-	-	-	-
	Osteogeneiosus militaris (Linnaeus, 1758)	2002/782	+	-	-	-	-	-	-	-
Bagridae	*Hemibagrus filamentus* (Fang and Chaux, 1949)	2002/586	+	+	-	-	-	-	-	-
	Hemibagrus nemurus (Valenciennes, 1840)	2010/792	+	+	+	+	+	+	+	+
	Hemibagrus planiceps (Valenciennes, 1840)	2002/294	-	-	-	-	-	+	-	+
	Hemibagrus wyckii (Bleeker, 1858)	2002/293	-	-	+	-	-	-	-	-
	Mystus castaneus Ng, 2002	2010/190	-	+	+	+	+	+	-	+
	Mystus vittatus (Bloch, 1794)	2002/592	-	+	-	-	-	-	-	-
	Mystus spp.	2002/096	-	-	-	+	-	-	-	-
Belonidae	*Strongylura strongylura* (van Hesselt, 1823)	2002/784	+	-	-	+	-	-	-	-
	Xenentodon canciloides (Bleeker, 1854)	2002/095	-	-	-	+	+	-	-	+
Channidae	*Channa lucius* (Cuvier, 1831)	2002/530	-	-	-	-	-	-	-	+
	Channa marulioides (Bleeker, 1851)	2002/584	-	-	-	-	-	-	-	+
	Channa micropeltes (Cuvier, 1831)	2010/391	-	-	+	-	+	+	-	+
	Channa striata (Bloch, 1793)	2010/192	+	-	-	-	+	+	+	+

TABLE 1. ***CONTINUED.***

FAMILY	SPECIES	VOUCHER # (USM/BIO/...)	TIn	PSlk	Pt	LC	C	K	B	T
Cichlidae	*Cichla ocellaris* Bloch and Schneider, 1801	2010/430	-	-	-	-	+	-	-	+
	Oreochromis spp.	2010/433	-	-	-	-	+	+	+	-
Clariidae	*Clarias batrachus* (Linnaeus, 1758)	2002/302	-	-	-	-	-	+	-	-
	Clarias teijsmanni Bleeker 1857	2002/291	-	-	-	-	-	-	-	+
Cobitidae	*Syncrossus hymenophysa* (Bleeker, 1852)	2002/296	-	-	-	+	-	-	-	-
Cobitidae	*Butis melanostigma* (Bleeker, 1849)	2002/633	+	-	-	-	-	-	-	-
Cynoglossidae	*Cynoglossus cynoglossus* (Hamilton, 1822)	2002/288	+	-	-	-	-	-	-	-
Cyprinidae	*Bagrichthys macracanthus* (Bleeker, 1854)	2002/292	-	-	+	-	-	-	-	-
	Balantiocheilos melanopterus (Bleeker, 1850)	2002/628	-	-	-	-	-	-	-	+
	Barbichthys laevis (Valenciennes, 1842)	2002/588	-	+	+	+	-	-	-	-
	Barbichthys spp.	2002/788	-	-	-	+	-	-	-	-
	Barbonymus altus (Günther, 1868)	2002/527	-	+	-	-	-	-	-	-
	Barbonymus gonionotus (Bleeker, 1849)	2010/390	+	+	+	+	+	+	+	+
	Barbonymus schwanenfeldii (Bleeker, 1854)	2010/134	-	+	+	+	+	+	-	+
	Cyclocheilichthys apogon (Valanciannes, 1842)	2010/130	-	+	+	-	+	+	-	+
	Cyclocheilichthys armatus (Valenciennes, 1842)	2002/538	-	+	+	+	+	+	-	-
	Cyclocheilichthys heteronema (Bleeker,1854)	2002/304	-	+	+	-	+	-	-	-
	Cyclocheilichthys lagleri Sontirat, 1989	2002/629	-	-	+	-	-	-	-	-
	Epalzeorhynchos spp.	2002/305	-	-	-	+	+	-	-	-
	Garra spp.	2002/097	-	-	-	+	-	-	-	-
	Hampala macrolepidota Kuhl and Van Hasselt, 1823	2010/129	-	+	+	+	+	+	+	+
	Hypophthalmichthys nobilis (Richardson, 1845)	2002/303	-	+	-	-	-	-	-	-
	Hypsibarbus lagleri Rainboth, 1996	2002/626	-	-	-	+	-	-	-	-
	Hypsibarbus wetmorei (Smith, 1931)	2002/537	-	-	-	-	-	-	-	+
	Labiobarbus fasciatus (Bleeker, 1853)	2010/531	+	+	+	+	+	+	-	+
	Labiobarbus festivus (Heckel, 1843)	2010/191	-	-	-	-	-	+	-	-
	Labiobarbus leptocheilus (Valenciennes, 1842)	2010/730	-	-	-	-	-	+	+	-
	Labiobarbus lineatus (Sauvage, 1878)	2002/531	-	+	+	+	+	+	-	+
	Leptobarbus hoevenii (Bleeker, 1851)	2002/529	-	+	-	-	+	-	-	+
	Lobocheilos rhabdoura (Fowler, 1934)	2002/591	-	-	-	-	-	-	-	+
	Luciosoma setigerum (Valenciennes, 1842)	2002/588	-	-	-	+	-	-	-	-
	Luciosoma trinema (Bleeker, 1852)	2002/533	-	-	-	+	-	-	-	-
	Mystacoleucus marginatus (Valenciennes, 1842)	2010/132	-	-	+	+	+	+	+	+
	Neolissochilus hexagonolepis (McClelland, 1839)	2002/301	-	-	-	-	-	-	-	+
	Neolissochilus soroides (Duncker, 1904)	2002/299	-	-	-	-	-	-	-	+
	Osteochilus melanopleurus (Bleeker, 1852)	2010/291	+	+	-	+	-	+	-	+
	Osteochilus microcephalus (Valenciennes, 1842)	2002/631	+	+	+	+	+	+	-	-
	Osteochilus vittatus (Valenciennes, 18420)	2010/128	+	+	+	+	+	+	+	+
	Osteochilus spp.	2002/298	-	-	+	+	-	-	-	-
	Oxygaster anomalura Hasselt, 1823	2010/131	-	-	-	+	+	+	+	+
	Parachela siamensis (Günther, 1868)	2002/783	+	+	-	-	-	-	-	-
	Poropuntius deauratus (Valenciennes, 1842)	2010/431	-	-	-	-	+	+	-	+
	Puntioplites bulu (Bleeker, 1851)	2010/293	-	+	+	+	+	+	+	+
	Puntius binotatus (Valenciennes, 1842)	2002/297	-	-	+	-	-	-	-	-
	Puntius lateristriga (Valenciennes, 1842)	2002/092	-	-	-	-	-	-	-	+
	Rasbora sumatrana (Bleeker, 1852)	2010/393	-	-	-	-	-	+	-	-
	Rasbora tornieri Ahl, 1922	2002/630	+	+	+	+	+	+	-	-
	Thynnichthys thynnoides (Bleeker, 1852)	2010/133	-	+	+	+	+	+	-	+
	Tor tambra (Valenciennes, 1842)	2002/089	-	-	-	-	-	-	-	+
	Tor spp.	2010/728	-	-	-	-	-	+	+	+
Dasyatidae	*Dasyatis laosensis* Robert and Kasnasuta, 1987	2002/589	-	-	-	+	-	-	-	-
Datnioididae	*Datnioides microlepis* Bleeker, 1854	2002/787	+	-	-	-	-	-	-	-
Eleotridae	*Bostrychus sinensis* Lacepède, 1801	2002/589	+	+	-	-	-	-	-	-
	Oxyeleotris marmorata (Bleeker, 1852)	2010/394	-	+	+	+	+	+	-	+
Engraulidae	*Setipinna melanochir* (Bleeker, 1849)	2002/098	+	-	-	-	-	-	-	-
	Setipinna tenuifilis (Valenciennes, 1848)	2002/786	+	+	-	-	-	-	-	-
Gobiidae	*Glossogobius aureus* Akihito and Meguro, 1975	2002/632	+	+	-	-	-	-	-	-

TABLE 1. ***CONTINUED.***

FAMILY	SPECIES	VOUCHER # (USM/BIO/...)	TIn	PSlk	Pt	LC	C	K	B	T
Gobiidae	*Glossogobius giuris* (Hamilton, 1822)	2002/789	+	-	-	-	-	-	-	-
Helostomatidae	*Helostoma temminkii* Cuvier, 1829	2002/528	-	+	-	-	-	-	-	-
Loricariidae	*Pterygoplichthys pardalis* (Castelnau, 1855)	2002/087	-	+	-	-	-	-	-	-
Mastacembelidae	*Mastacembelus erythrotaenia* Bleeker, 1850	2010/533	+	+	-	+	+	+	+	+
	Mastacembelus favus Hora, 1942	2002/298	-	-	-	-	+	-	-	+
Megalopidae	*Megalops cyprinoides* (Broussonet, 1782)	2002/100	-	+	-	-	-	-	-	-
Nandidae	*Pristolepis fasciata* (Bleeker, 1851)	2010/532	+	+	+	+	+	+	-	+
	Pristolepis grootii (Bleeker, 1852)	2002/086	+	-	-	-	+	-	-	+
Notopteridae	*Chitala chitala* (Hamilton, 1822)	2010/432	-	-	-	-	+	+	+	+
	Chitala lopis (Bleeker, 1851)	2002/535	-	-	+	+	-	+	-	+
	Chitala ornata (Gray, 1831)	2002/526	-	-	+	-	-	-	-	-
	Notopterus notopterus (Pallas, 1769)	2010/292	+	+	+	+	+	+	+	+
Osphronemidae	*Osphronemus goramy* Lacepède, 1801	2010/793	-	+	+	+	+	-	-	+
	Trichogaster pectoralis (Regan, 1901)	2002/093	-	-	-	-	-	+	-	-
	Trichogaster trichopterus (Pallas, 1770)	2010/392	-	+	-	-	+	-	-	-
Pangasiidae	*Pangasianodon hypophthalmus* (Sauvage, 1878)	2010/290	-	-	-	-	-	-	+	-
	Pseudolais micronemus (Bleeker, 1846)	2002/088	+	-	+	-	+	+	+	+
Polynemidae	*Polynemus dubius* (Bleeker, 1853)	2002/790	+	-	-	-	-	-	-	-
Pristigasteridae	*Ilisha megaloptera* (Swainson, 1839)	2002/785	+	+	-	-	-	-	-	-
Scatophagidae	*Scatophagus argus* (Linnaeus, 1766)	2002/099	+	-	-	-	-	-	-	-
Sciaenidae	*Johnius dussumieri* (Cuvier, 1830)	2002/094	+	-	-	-	-	-	-	-
	Otolithoides pama (Hamilton, 1822)	2002/634	+	-	-	-	-	-	-	-
Siluridae	*Ompok bimaculatus* (Bloch, 1794)	2002/532	-	-	-	+	-	-	-	-
	Ompok hypophthalmus (Bleeker, 1846)	2002/543	+	+	-	-	-	-	-	-
Syngnathidae	*Doryichthys boaja* (Bleeker, 1850)	2002/102	+	-	-	-	-	-	-	-
Tetraodontidae	*Auriglobus modestus* (Bleeker, 1850)	2002/090	+	+	-	-	-	-	-	-
	Tetraodon sp.	2010/731	-	-	-	-	-	-	+	-
Toxotidae	*Toxotes chatareus* (Hamilton, 1822)	2002/306	+	+	-	-	-	-	-	-
Total number of species	107		41	43	30	36	35	35	17	42
Total number of family	33		24	19	8	11	11	11	7	12

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Appendix 1. Some pictures of fishes from Perak River, Perak, Malaysia. Measurement is presented as total length.

CYPRINIFORMES

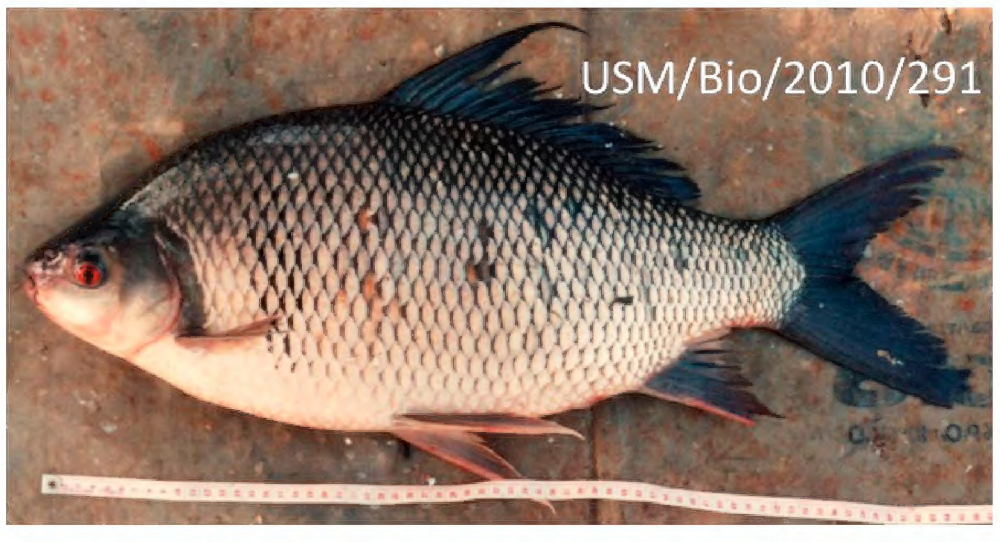
Cyprinidae

Barbonymus schwanenfeldii, 246mm TL. (Picture by Amir Shah Ruddin Md. Shah)

Cyclocheilichthys apogon (Picture by Amir Shah Ruddin Md. Shah)

Hampala macrolepidota (Picture by Amir Shah Ruddin Md. Shah)

Labiobarbus leptocheilus, 228mm TL. (Picture by Amir Shah Ruddin Md. Shah)



Osteochilus melanopleurus, 670mm TL. (Picture by Amir Shah Ruddin Md. Shah)

Osteochilus vittatus, 201mm TL. (Picture by Amir Shah Ruddin Md. Shah)

Oxygaster anomalura (Picture by Amir Shah Ruddin Md. Shah)

Poropuntius deauratus (Picture by Amir Shah Ruddin Md. Shah)

Puntioplites bulu (Picture by Amir Shah Ruddin Md. Shah)

Rasbora sumatrana (Picture by Amir Shah Ruddin Md. Shah)

Tor tambra, 367mm TL. (Picture by Amir Shah Ruddin Md. Shah)

APPENDIX 1. ***CONTINUED.***

OSTEOGLOSSIFORMES

NOTOPTERIDAE

Notopterus notopterus (Picture by Amir Shah Ruddin Md. Shah)

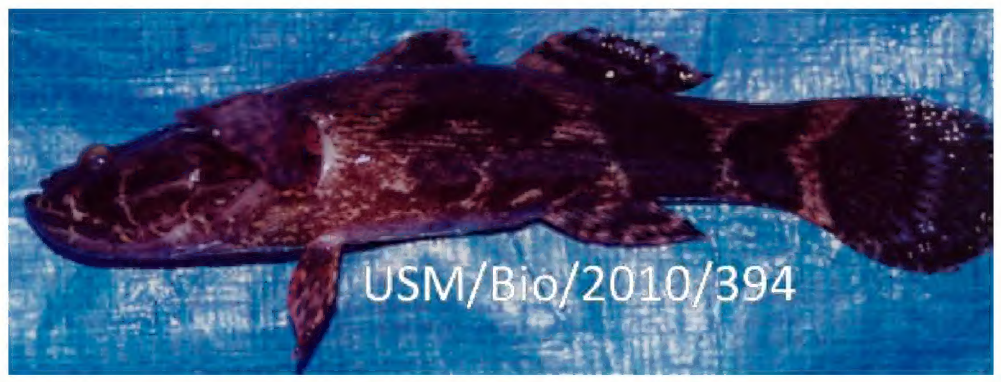
PERCIFORMES

CHANNIDAE

Channa micropeltes, 312mm TL. (Picture by Amir Shah Ruddin Md. Shah)

Channa lucius (Picture by Amir Shah Ruddin Md. Shah)

ELEOTRIDAE



Oxyeleotris marmorata (Picture by Amir Shah Ruddin Md. Shah)

SILURIFORMES

BAGRIDAE

Hemibagrus nemurus, 248mm TL. (Picture by Amir Shah Ruddin Md. Shah)

TETRAODONTIFORMES

TETRAODONTIDAE

Tetraodon sp. (Picture by Amir Shah Ruddin Md. Shah)